

WEST Search History

DATE: Sunday, February 15, 2004

Hide?	<u>Set</u> <u>Name</u>	<u>Query</u>	<u>Hit</u> <u>Count</u>
	<i>DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=ADJ</i>		
<input type="checkbox"/>	L45	L42 and ("SENSE" or sensitiv\$4)	12
<input type="checkbox"/>	L44	L43 and ((control\$4 or driv\$4) with (switch\$3))	6
<input type="checkbox"/>	L43	l42 and (switch\$3)	13
<input type="checkbox"/>	L42	L41 and (birdcage or "bird cage")	16
<input type="checkbox"/>	L41	L11 and (head or brain or skull)	509
<input type="checkbox"/>	L40	20020169374	2
<input type="checkbox"/>	L39	20030184293	2
<input type="checkbox"/>	L38	20030184294	2
<input type="checkbox"/>	L37	20030020475	2
	<i>DB=PGPB,USPT,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=ADJ</i>		
<input type="checkbox"/>	L36	L35 and (combin\$4 with signal)	9
<input type="checkbox"/>	L35	L34 and L13	15
<input type="checkbox"/>	L34	L32 or L33	10804
<input type="checkbox"/>	L33	(600/407 600/408 600/409 600/410 600/411 600/412 600/413 600/414 600/415 600/416 600/417 600/418 600/419 600/420 600/421 600/422 600/423 600/424 600/425 600/426).ccls.	4861
<input type="checkbox"/>	L32	(324/300 324/301 324/302 324/303 324/304 324/305 324/306 324/307 324/308 324/309 324/310 324/311 324/312 324/313 324/314 324/315 324/316 324/317 324/318 324/319 324/320 324/321 324/322).ccls.	6920
<input type="checkbox"/>	L31	L13 and L30	1
	<i>DB=USPT,PGPB,JPAB,EPAB,DWPI,TDBD; PLUR=YES; OP=ADJ</i>		
<input type="checkbox"/>	L30	L29 and (encod\$4 or spatial\$3)	22
<input type="checkbox"/>	L29	L28 and (sensitivity)	22
<input type="checkbox"/>	L28	L27 and (independent\$4)	26
<input type="checkbox"/>	L27	L26 and (array or neighbor\$6 or proximity or other)	36
<input type="checkbox"/>	L26	L25 and ("sense")	43
<input type="checkbox"/>	L25	L24 and ((two or "2" or four or "4" or second or secondary or fourth or quadrature or quadrupole or quadratic) with ("set" or group or plurality or multiple or number or another))	148
<input type="checkbox"/>	L24	L23 and (((radio adj frequency) or RF or radio-frequency or radiofrequency) with (coil or antenna or probe))	168
<input type="checkbox"/>	L23	L22 and (phase)	171

<input type="checkbox"/>	L22	L21 and (birdcage or (head with coil) or (volume with resonator))	209
<input type="checkbox"/>	L21	L20 and (select\$4 or choos\$4 or rout\$4 or chosen or pick\$4 or identif\$9 or control\$8 or direct\$4)	971
<input type="checkbox"/>	L20	L19 and ((channel or line or input) with (receiv\$4 or detect\$6 or sens\$4))	975
<input type="checkbox"/>	L19	L18 and (channel or line or input)	1546
<input type="checkbox"/>	L18	L17 and (("set" or group or plurality or multiple or number or second or secondary or another) with (coil or antenna or probe))	1697
<input type="checkbox"/>	L17	L16 and ((radio adj frequency) or RF or radio-frequency or radiofrequency)	3588
<input type="checkbox"/>	L16	L15 and (receiv\$4 or detect\$6 or sens\$4)	10091
<input type="checkbox"/>	L15	L14 and ((combin\$8 or composite or add\$6) with (signal))	10982
<input type="checkbox"/>	L14	((magnetic adj resonance) or MRI or NMR)	166077
<i>DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=ADJ</i>			
<input type="checkbox"/>	L13	L12 and (phase with encod\$4)	50
<input type="checkbox"/>	L12	L11 and ("SENSE")	341
<input type="checkbox"/>	L11	L10 and (head or brain or skull or birdcage or "bird cage")	520
<input type="checkbox"/>	L10	L9 and ((select\$4 or choosing or chooses or rout\$3 or direct\$3) with (separat\$4 or individual\$3 or different or first or second))	938
<input type="checkbox"/>	L9	L7 and (select\$4 or choosing or chooses or rout\$3 or direct\$3)	1101
<input type="checkbox"/>	L8	L7 and (select\$6 or choosing or chooses or rout\$4 or direct\$4)	1101
<input type="checkbox"/>	L7	L6 and ("set" or plurality or group or pair or multiple or "more than one")	1103
<input type="checkbox"/>	L6	L5 and (combin\$8 or merg\$4)	1111
<input type="checkbox"/>	L5	L4 and ((separat\$4 or individual\$3 or different or first or second) with channel\$3)	1396
<input type="checkbox"/>	L4	L2 and ((receiv\$4 or detect\$3) with channel)	2345
<input type="checkbox"/>	L3	L2 and ((receiv\$6 or detect\$5) with channel)	2391
<input type="checkbox"/>	L2	L1 and (channel or path)	26097
<input type="checkbox"/>	L1	((magnetic adj resonance) or MRI or NMR)	173405

END OF SEARCH HISTORY

Hit List

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[Generate OACS](#)

Search Results - Record(s) 1 through 16 of 16 returned.

☐ 1. Document ID: US 20030020475 A1

Using default format because multiple data bases are involved.

L42: Entry 1 of 16

File: PGPB

Jan 30, 2003

PGPUB-DOCUMENT-NUMBER: 20030020475
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030020475 A1

TITLE: RF coil system for an MR apparatus

PUBLICATION-DATE: January 30, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Leussler, Christoph Guenther	Hamburg		DE	

US-CL-CURRENT: [324/318](#); [324/309](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Drawings
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☐ 2. Document ID: US 20030001573 A1

L42: Entry 2 of 16

File: PGPB

Jan 2, 2003

PGPUB-DOCUMENT-NUMBER: 20030001573
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030001573 A1

TITLE: Multimode operation of quadrature phased array MR coil systems

PUBLICATION-DATE: January 2, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Misic, George J.	Allison Park	PA	US	

US-CL-CURRENT: [324/318](#); [324/309](#), [324/322](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Drawings
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☐ 3. Document ID: US 20020190716 A1

L42: Entry 3 of 16

File: PGPB

Dec 19, 2002

PGPUB-DOCUMENT-NUMBER: 20020190716
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020190716 A1

TITLE: Multimode operation of quadrature phased array MR coil systems

PUBLICATION-DATE: December 19, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Misic, George J.	Allison Park	PA	US	

US-CL-CURRENT: 324/318; 324/309, 324/322, 335/297

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. De
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☐ 4. Document ID: US 20020130661 A1

L42: Entry 4 of 16

File: PGPB

Sep 19, 2002

PGPUB-DOCUMENT-NUMBER: 20020130661
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020130661 A1

TITLE: Nuclear magnetic resonance analysis of multiple samples

PUBLICATION-DATE: September 19, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Rafferty, Daniel	Lafayette	IN	US	
Fisher, George G.	Oak Harbor	WA	US	
Petucci, Christopher J.	Memphis	TN	US	
McNamara, Ernesto	Alexandria	VA	US	

US-CL-CURRENT: 324/318; 324/309, 324/321, 324/322

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. De
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☐ 5. Document ID: US 20020125888 A1

L42: Entry 5 of 16

File: PGPB

Sep 12, 2002

PGPUB-DOCUMENT-NUMBER: 20020125888
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020125888 A1

TITLE: Magnetic resonance imaging apparatus

PUBLICATION-DATE: September 12, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Visser, Frederik	Eindhoven		NL	
Haans, Paulus Cornelius Hendrikus Adrianus	Eindhoven		NL	
Van Den Brink, Johan Samuel	Eindhoven		NL	

US-CL-CURRENT: 324/318; 324/309

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	FWOC	Drawings
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☐ 6. Document ID: US 6650118 B2

L42: Entry 6 of 16

File: USPT

Nov 18, 2003

US-PAT-NO: 6650118

DOCUMENT-IDENTIFIER: US 6650118 B2

TITLE: RF coil system for an MR apparatus

DATE-ISSUED: November 18, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Leussler, Christoph Guenther	Hamburg			DE

US-CL-CURRENT: 324/318; 324/322

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	FWOC	Drawings
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☐ 7. Document ID: US 6549799 B2

L42: Entry 7 of 16

File: USPT

Apr 15, 2003

US-PAT-NO: 6549799

DOCUMENT-IDENTIFIER: US 6549799 B2

TITLE: Concurrent MRI of multiple objects

DATE-ISSUED: April 15, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bock, Nicholas A.	London			CA
Henkelman, R. Mark	Toronto			CA

US-CL-CURRENT: 600/422; 324/307, 324/309, 600/410, 600/411

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw D
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☐ 8. Document ID: US 6501274 B1

L42: Entry 8 of 16

File: USPT

Dec 31, 2002

US-PAT-NO: 6501274

DOCUMENT-IDENTIFIER: US 6501274 B1

TITLE: Magnetic resonance imaging system using coils having paraxially distributed transmission line elements with outer and inner conductors

DATE-ISSUED: December 31, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ledden; Patrick	Malden	MA		

US-CL-CURRENT: 324/318

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw D
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☐ 9. Document ID: US 6356081 B1

L42: Entry 9 of 16

File: USPT

Mar 12, 2002

US-PAT-NO: 6356081

DOCUMENT-IDENTIFIER: US 6356081 B1

TITLE: Multimode operation of quadrature phased array MR coil systems

DATE-ISSUED: March 12, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Misic; George J.	Allison Park	PA		

US-CL-CURRENT: 324/318; 600/422

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw D
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☐ 10. Document ID: US 6194900 B1

L42: Entry 10 of 16

File: USPT

Feb 27, 2001

US-PAT-NO: 6194900

DOCUMENT-IDENTIFIER: US 6194900 B1

TITLE: Integrated miniaturized device for processing and NMR detection of liquid

phase samples

DATE-ISSUED: February 27, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Freeman; Dominique M.	Pescadero	CA		
Swedberg; Sally A.	Palo Alto	CA		

US-CL-CURRENT: 324/321; 324/318

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw De
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☐ 11. Document ID: US 6150816 A

L42: Entry 11 of 16

File: USPT

Nov 21, 2000

US-PAT-NO: 6150816

DOCUMENT-IDENTIFIER: US 6150816 A

TITLE: Radio-frequency coil array for resonance analysis

DATE-ISSUED: November 21, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Srinivasan; Ravi	Richmond Heights	OH		

US-CL-CURRENT: 324/318; 324/322

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw De
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☐ 12. Document ID: US 5999000 A

L42: Entry 12 of 16

File: USPT

Dec 7, 1999

US-PAT-NO: 5999000

DOCUMENT-IDENTIFIER: US 5999000 A

TITLE: Radio-frequency coil and method for resonance imaging/analysis

DATE-ISSUED: December 7, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Srinivasan; Ravi	Richmond Heights	OH		

US-CL-CURRENT: 324/318; 324/322

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw De
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☐ 13. Document ID: US 5777474 A

L42: Entry 13 of 16

File: USPT

Jul 7, 1998

US-PAT-NO: 5777474

DOCUMENT-IDENTIFIER: US 5777474 A

TITLE: Radio-frequency coil and method for resonance imaging/analysis

DATE-ISSUED: July 7, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Srinivasan; Ravi	Richmond Heights	OH		

US-CL-CURRENT: 324/318; 324/322

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWOC	Drawn
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☐ 14. Document ID: US 5664568 A

L42: Entry 14 of 16

File: USPT

Sep 9, 1997

US-PAT-NO: 5664568

DOCUMENT-IDENTIFIER: US 5664568 A

TITLE: Split-top, neck and head vascular array for magnetic resonance imaging

DATE-ISSUED: September 9, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Srinivasan; Ravi	Richmond Hts.	OH		
Henderson; Robert G.	Wickliffe	OH		
Elek; Robert A.	Chardon	OH		

US-CL-CURRENT: 600/422; 324/318, 324/322

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWOC	Drawn
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☐ 15. Document ID: US 5041789 A

L42: Entry 15 of 16

File: USPT

Aug 20, 1991

US-PAT-NO: 5041789

DOCUMENT-IDENTIFIER: US 5041789 A

TITLE: Magnetic-resonance instrument employing barcode experiment specification

DATE-ISSUED: August 20, 1991

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Keller; Tony	Reinstetten-Forchheim			DE
Laukien; Gunther R.	Rheinstetten			DE
Spraul; Manfred	Ettlingen			DE

US-CL-CURRENT: 324/318; 324/322

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	NMC	Draw D
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☐ 16. Document ID: US 4689563 A

L42: Entry 16 of 16

File: USPT

Aug 25, 1987

US-PAT-NO: 4689563

DOCUMENT-IDENTIFIER: US 4689563 A

TITLE: High-field nuclear magnetic resonance imaging/spectroscopy system

DATE-ISSUED: August 25, 1987

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bottomley; Paul A.	Clifton Park	NY		
Edelstein; William A.	Schenectady	NY		
Hart, Jr.; Howard R.	Schenectady	NY		
Schenck; John F.	Schenectady	NY		
Redington; Rowland W.	Schenectady	NY		
Leue; William M.	Albany	NY		

US-CL-CURRENT: 324/309

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	NMC	Draw D
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Bkwd Refs

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Term	Documents
BIRDCAGE	630
BIRDCAGES	48
"BIRD CAGE"	0
(41 AND (BIRDCAGE OR "BIRD CAGE")).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	16
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Search Results - Record(s) 1 through 13 of 13 returned.

☐ 1. Document ID: US 20030020475 A1

Using default format because multiple data bases are involved.

L43: Entry 1 of 13

File: PGPB

Jan 30, 2003

PGPUB-DOCUMENT-NUMBER: 20030020475

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030020475 A1

TITLE: RF coil system for an MR apparatus

PUBLICATION-DATE: January 30, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Leussler, Christoph Guenther	Hamburg		DE	

US-CL-CURRENT: [324/318](#); [324/309](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Ds
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☐ 2. Document ID: US 20030001573 A1

L43: Entry 2 of 13

File: PGPB

Jan 2, 2003

PGPUB-DOCUMENT-NUMBER: 20030001573

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030001573 A1

TITLE: Multimode operation of quadrature phased array MR coil systems

PUBLICATION-DATE: January 2, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Misic, George J.	Allison Park	PA	US	

US-CL-CURRENT: [324/318](#); [324/309](#), [324/322](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Ds
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☐ 3. Document ID: US 20020190716 A1

L43: Entry 3 of 13

File: PGPB

Dec 19, 2002

PGPUB-DOCUMENT-NUMBER: 20020190716
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020190716 A1

TITLE: Multimode operation of quadrature phased array MR coil systems

PUBLICATION-DATE: December 19, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Misic, George J.	Allison Park	PA	US	

US-CL-CURRENT: 324/318; 324/309, 324/322, 335/297

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. De
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☐ 4. Document ID: US 20020130661 A1

L43: Entry 4 of 13

File: PGPB

Sep 19, 2002

PGPUB-DOCUMENT-NUMBER: 20020130661
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020130661 A1

TITLE: Nuclear magnetic resonance analysis of multiple samples

PUBLICATION-DATE: September 19, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Raftery, Daniel	Lafayette	IN	US	
Fisher, George G.	Oak Harbor	WA	US	
Petucci, Christopher J.	Memphis	TN	US	
McNamara, Ernesto	Alexandria	VA	US	

US-CL-CURRENT: 324/318; 324/309, 324/321, 324/322

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. De
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☐ 5. Document ID: US 20020125888 A1

L43: Entry 5 of 13

File: PGPB

Sep 12, 2002

PGPUB-DOCUMENT-NUMBER: 20020125888
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020125888 A1

TITLE: Magnetic resonance imaging apparatus

PUBLICATION-DATE: September 12, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Visser, Frederik	Eindhoven		NL	
Haans, Paulus Cornelius Hendrikus Adrianus	Eindhoven		NL	
Van Den Brink, Johan Samuel	Eindhoven		NL	

US-CL-CURRENT: 324/318; 324/309

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	RWMC	Draw D
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☐ 6. Document ID: US 6650118 B2

L43: Entry 6 of 13

File: USPT

Nov 18, 2003

US-PAT-NO: 6650118

DOCUMENT-IDENTIFIER: US 6650118 B2

TITLE: RF coil system for an MR apparatus

DATE-ISSUED: November 18, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Leussler; Christoph Guenther	Hamburg			DE

US-CL-CURRENT: 324/318; 324/322

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	RWMC	Draw D
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☐ 7. Document ID: US 6549799 B2

L43: Entry 7 of 13

File: USPT

Apr 15, 2003

US-PAT-NO: 6549799

DOCUMENT-IDENTIFIER: US 6549799 B2

TITLE: Concurrent MRI of multiple objects

DATE-ISSUED: April 15, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bock; Nicholas A.	London			CA
Henkelman; R. Mark	Toronto			CA

US-CL-CURRENT: 600/422; 324/307, 324/309, 600/410, 600/411

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw D
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☐ 8. Document ID: US 6501274 B1

L43: Entry 8 of 13

File: USPT

Dec 31, 2002

US-PAT-NO: 6501274

DOCUMENT-IDENTIFIER: US 6501274 B1

TITLE: Magnetic resonance imaging system using coils having paraxially distributed transmission line elements with outer and inner conductors

DATE-ISSUED: December 31, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ledden; Patrick	Malden	MA		

US-CL-CURRENT: 324/318

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw D
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☐ 9. Document ID: US 6356081 B1

L43: Entry 9 of 13

File: USPT

Mar 12, 2002

US-PAT-NO: 6356081

DOCUMENT-IDENTIFIER: US 6356081 B1

TITLE: Multimode operation of quadrature phased array MR coil systems

DATE-ISSUED: March 12, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Misic; George J.	Allison Park	PA		

US-CL-CURRENT: 324/318; 600/422

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw D
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☐ 10. Document ID: US 6194900 B1

L43: Entry 10 of 13

File: USPT

Feb 27, 2001

US-PAT-NO: 6194900

DOCUMENT-IDENTIFIER: US 6194900 B1

TITLE: Integrated miniaturized device for processing and NMR detection of liquid

phase samples

DATE-ISSUED: February 27, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Freeman; Dominique M.	Pescadero	CA		
Swedberg; Sally A.	Palo Alto	CA		

US-CL-CURRENT: 324/321; 324/318

Full	Title	Citation	Front	Review	Classification	Data	Reference			Claims	KWC	Draw D
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☐ 11. Document ID: US 6150816 A

L43: Entry 11 of 13

File: USPT

Nov 21, 2000

US-PAT-NO: 6150816

DOCUMENT-IDENTIFIER: US 6150816 A

TITLE: Radio-frequency coil array for resonance analysis

DATE-ISSUED: November 21, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Srinivasan; Ravi	Richmond Heights	OH		

US-CL-CURRENT: 324/318; 324/322

Full	Title	Citation	Front	Review	Classification	Data	Reference			Claims	KWC	Draw D
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☐ 12. Document ID: US 5041789 A

L43: Entry 12 of 13

File: USPT

Aug 20, 1991

US-PAT-NO: 5041789

DOCUMENT-IDENTIFIER: US 5041789 A

TITLE: Magnetic-resonance instrument employing barcode experiment specification

DATE-ISSUED: August 20, 1991

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Keller; Tony	Reinstetten-Forchheim			DE
Laukien; Gunther R.	Rheinstetten			DE
Spraul; Manfred	Ettlingen			DE

US-CL-CURRENT: 324/318; 324/322

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw D.
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☐ 13. Document ID: US 4689563 A

L43: Entry 13 of 13

File: USPT

Aug 25, 1987

US-PAT-NO: 4689563

DOCUMENT-IDENTIFIER: US 4689563 A

TITLE: High-field nuclear magnetic resonance imaging/spectroscopy system

DATE-ISSUED: August 25, 1987

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bottomley; Paul A.	Clifton Park	NY		
Edelstein; William A.	Schenectady	NY		
Hart, Jr.; Howard R.	Schenectady	NY		
Schenck; John F.	Schenectady	NY		
Redington; Rowland W.	Schenectady	NY		
Leue; William M.	Albany	NY		

US-CL-CURRENT: 324/309

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw D.
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Term	Documents
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SWITCH	1790641
SWITCHA	210
SWITCHAAP	1
SWITCHAB	11
SWITCHABE	5
SWITCHABL	13
SWITCHAC	9
SWITCHACT	9
SWITCHAD	10
SWITCHADG	1
(L42 AND (SWITCH\$3)).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	13

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L43: Entry 9 of 13

File: USPT

Mar 12, 2002

DOCUMENT-IDENTIFIER: US 6356081 B1

TITLE: Multimode operation of quadrature phased array MR coil systems

Abstract Text (1):

A coil interface for coupling a phased array magnetic resonance imaging coil to a magnetic resonance imaging system. The coil interface includes a plurality of signal inputs and a plurality of output ports. Each of the output ports is associated with a receiver in the magnetic resonance imaging system. The coil interface also includes an interface circuit. The interface circuit selectively couples at least two of the signal inputs to at least one of the plurality of input ports. Where the coil is a quadrature phased array coil, a preferred embodiment allows the two quadrature signals to be acquired as a single signal, precombined at the RF level within the coil interface, or as two separate RF signals by two of the receivers of the magnetic resonance imaging system hardware.

Brief Summary Text (2):

The advantages of using phased array or multi-coil MR coil systems to enhance magnetic resonance imaging and spectroscopy are well known. A situation facing the designer of such coils is the finite number of available simultaneous data acquisition channels in the host MR system; frequently, there are only four available channels, sometimes known as receivers, in the host system.

Brief Summary Text (3):

Another issue is the reconstruction time to create the images from the collected data; processing multiple channels to form a single image increases the time needed by the magnetic resonance imaging system to process the data, by two or three dimensional Fourier Transform techniques or other methods, to create the final images. Another consideration is the fact that data acquisition hardware with additional performance capabilities may only be available on one receiver, or on fewer than the total number of available receivers.

Brief Summary Text (5):

Reconstruction of an image from two quadrature modes of a specific phased array coil element via two separate data acquisition channels [or receivers] provides the best possible image signal to noise ratio and uniformity, since the data can always be reconstructed in the most optimum way. However, the use of two separate receivers for the two quadrature signals from a specific phased array coil element may cause problems with reconstruction time, or limitations due to the finite number of available receivers. Thus, there may be conditions when combining the two quadrature signals at the RF level into a single signal may be most advantageous, and other times when processing the two RF signals independently via two separate data acquisition receivers may be the best scheme.

Brief Summary Text (6):

The present invention allows the two quadrature signals to be acquired as a single signal, precombined at the RF level within the coil interface, or as two separate RF signals by two of the receivers of the phased array hardware. It also provides a means for remote selection of the mode of operation from the operator's console when the system is used with a MRI system, such as the GEMS Signa system.

Detailed Description Text (2):

The presently preferred embodiments of the invention will now be described with reference to the Figures, in which like elements are referred to by like numerals. A number of specific applications of a preferred embodiment are discussed. In particular, the multimode operation of a neurovascular coil designed for and operating on the General Electric Medical Systems Signa MRI system is described; however, the preferred embodiments may be applied to other coils and other systems by those skilled in the art after reviewing this detailed description.

Detailed Description Text (3):

FIG. 1 is wire model of a phased array neurovascular coil 50, also referred to herein as a neurovascular array coil. The neurovascular array coil 50 contains four separate imaging coils. The first coil is a quadrature tapered birdcage 60 covering the brain and head. Further details regarding the quadrature tapered birdcage are provided in U.S. application Ser. No. 09/449256, ref. filed Nov. 24, 1999, the contents of which are incorporated herein by reference. The first coil may alternatively be in the form of a domed birdcage, such as is described in U.S. Pat. No. 5,602,479, the contents of which are incorporated herein by reference, although the tapered birdcage is preferred because it provides improved field homogeneity on the XZ and YZ image planes.

Detailed Description Text (6):

FIGS. 2A and 2B are electrical schematics of a coil interface circuit 100 that provides multimode operation of the phased array neurovascular coil 50 shown in FIG. 1. The coil interface circuit 100 couples the phased array neurovascular coil 50 to a magnetic resonance imaging system. The coil interface circuit 100 has a number of signal input points 102, which are coupled to receive MR signals from the phased array neurovascular coil 50. As shown in FIG. 2A, signal inputs 102 are coupled to output ports, port #2, port #3, port #4, port #5, and port #6, which are in turn coupled to predetermined MRI system receivers. Many systems, including the GEMS Signa system, provide only four receiver channels. Thus, because all the signal inputs 102 cannot simultaneously be applied to the MRI system receivers when the number of potential signal inputs 102 exceeds the number of receivers, the interface circuit 100 allows selected signal inputs 102 to be coupled to the MRI system receivers.

Detailed Description Text (7):

Selection of the operational modes of the phased array neurovascular coil 50 is made in the coil interface 100 unit by the use of PIN diode RF switches, as further described below. The following table defines the relationship between signal inputs 102 to the coil interface 100 and outputs, e.g. port #2-6, from the coil interface 100.

Detailed Description Text (8):

In the table above, Head I refers to the in-phase MR signal from the birdcage coil 60, Head Q refers to the quadrature MR signal from the birdcage coil 60, Cspine refers to the combined MR signals from the posterior cervical spine coils 70, ANT SUP refers to the MR signal from the superior anterior neck coil 80, and ANT INF refers to the MR signal from the inferior anterior neck coil 90.

Detailed Description Text (9):

As shown in FIG. 2A, the coil interface 100 is coupled to DC power supplies, +15V and -15V, from the MRI system. The electrical schematic of FIG. 2A also includes a number of inductors, labeled as "RFC"s, that function as RF chokes. The RF chokes are preferably self-resonant at approximately 63.87 MHz. For example, the RF chokes may be obtained from J. W. Miller, part no. RFC-50.

Detailed Description Text (10):

The birdcage coil 60 and the coil interface 100 are designed so that the two quadrature signal components from this coil element may selectively be combined

into a single signal for simultaneous use with the other three coil elements. This provides coverage of the entire volume within the quadrature neurovascular array 50 using a total of four simultaneous data acquisition channels [receivers] from the MRI system. In addition, by combining the two quadrature signal components, a preferred embodiment allows for applications employing a single FAST receiver, where only one of the available phased array receivers has the FAST data acquisition capability.

Detailed Description Text (11):

When the brain or the brain, brain stem, and cervical region of the spinal cord, for example, are to be imaged with the highest possible image signal to noise ratio and uniformity, another mode may be used. Specifically, the coil interface 100 directs the two quadrature components of the MR signal from the tapered birdcage coil element 60 into two separate receivers for optimum results. An advantage of this feature is that it preserves the ability to simultaneously cover the entire region from the aortic arch to the top of the head in one phased array acquisition, enables the use of one high performance receiver channel for complete acquisition of images from the brain, and yet enables the highest degrees of resolution, signal to noise ratio, and uniformity to be obtained from the brain, and associated neurological areas of interest by acquiring the data from the two quadrature modes of the tapered birdcage coil element through two separate receivers.

Detailed Description Text (12):

The coil interface 100 supports distinct imaging functions by automatic selection of the optimum assembly of the array coil elements. As described below, the coil interface 100 may be remotely configured, i.e. the state of one or more PIN diode RF switches may be set, based upon inputs from the MRI system console. Examples of distinct imaging modes that may be supported a coil interface, such as the coil interface shown in FIGS. 2A and 2B, include: NEUROVASCULAR, HIGH RESOLUTION BRAIN, HIGH SPEED BRAIN, HIGH RESOLUTION BRAIN AND CERVICAL SPINE, CERVICAL SPINE, and VOLUME NECK.

Detailed Description Text (13):

Each of these modes is preferably activated by selecting the appropriate Coil Name from the coil selections on the console of the host MRI system when prescribing the scan. By way of the coil interface 100, the needed coils and the signal combining method are activated for the selected mode, and the unused coil elements are electronically disabled to optimize image quality and minimize artifacts. Each mode has a distinct method of operation as described below.

Detailed Description Text (15):

In NEUROVASCULAR mode, all of the coil elements in the phased array neurovascular coil 50 are active, and the birdcage coil 60 operates in quadrature with the two signals combined to drive a single receiver. Specifically, the coil interface 100 includes a combiner circuit, including a switch and a phase shifter, that is set to combine the in-phase, or "I," output and the quadrature, or "Q," output of the birdcage coil 60 before applying the signal to the MRI system preamplifier at port #5. The two posterior spine coils 70 drive a single receiver, such as port #4. The superior anterior neck coil 80 and the inferior anterior neck coil 90 each drive a separate receiver, such as ports #3 and #2, respectively. Thus, in NEUROVASCULAR mode, the coil interface 100 provides a total of four simultaneous data acquisitions, the maximum number of simultaneous data acquisitions that can be handled by the MRI system. Since the coverage volume is large, the signal to noise ratio performance of the head portion of the coverage may be slightly reduced, by the combination of the I and Q outputs of the birdcage coil 60, to allow only one receiver channel to be used to cover the head region.

Detailed Description Text (16):

FIG. 3 is a wire model of the phased array neurovascular coil 50 in NEUROVASCULAR mode. As noted above and shown in FIG. 3, all elements of the phased array

neurovascular coil 50 are activated and the MRI system operates in the phased array mode. The NEUROVASCULAR mode may be used for all types of brain and neck imaging, other than Echo Planar Imaging. The NEUROVASCULAR mode is particularly useful for brain and/or cervical spine localizers, imaging of the cervical spine, imaging of the carotid arteries, and imaging of the aortic arch. The preferred embodiment shown in FIG. 3 advantageously provides a field of view of up to 46 cm.

Detailed Description Text (17):

High Resolution Brain Mode

Detailed Description Text (18):

In HIGH RESOLUTION BRAIN mode, the two quadrature components of the MR signal from the birdcage coil 60 each drive a separate receiver channel on the MRI system, providing optimum uniformity and signal to noise ratio performance. Specifically, the coil interface 100 couples the I and Q signals from the birdcage coil 60 to separate receiver ports on the MRI system, such as ports 5 and 6, as shown in FIG. 2A and the table above. The combiner circuit in the coil interface 100 is electrically disconnected to allow independent reconstruction of the data from the two channels. The posterior cervical spine coils 70 and the anterior neck coils 80 and 90 are electrically disabled to minimize artifacts and undesirable coil interactions. Since the highest possible degree of signal to noise ratio and uniformity are desired, but coverage of the entire volume of the coil is not needed, two separate receivers are used for the birdcage coil 60 MR signal. Techniques for electrically disabling an imaging coil are well known to those skilled in the art.

Detailed Description Text (19):

FIG. 4 is a wire model of the phased array neurovascular coil in HIGH RESOLUTION BRAIN imaging mode. As shown in FIG. 4, only the quadrature birdcage coil 60 is activated; the cervical spine coils 70 and the anterior neck coils 80 and 90 are electrically disabled. The MRI system operates in phased array mode. The HIGH RESOLUTION BRAIN imaging mode may be used for all types of brain and/or head imaging, other than echo planar imaging, but is especially useful for high resolution studies of the brain. The HIGH RESOLUTION BRAIN imaging mode is also useful for high resolution Circle of Willis imaging. The preferred embodiment shown in FIG. 4 provides a field of view of up to 24 cm.

Detailed Description Text (20):

High Speed Brain Mode

Detailed Description Text (21):

The HIGH SPEED BRAIN mode routes the two quadrature modes of the head birdcage resonator 60 through the combiner circuit in the coil interface 100 to produce one signal containing the signal from both quadrature modes. In FIG. 2A, the combined signal is provided to the MRI system at port #5. The combined signal drives one channel of the phased array system [preferably Receiver 0 (Receiver selection 1 on LX systems) for the GEMS Signa system] to minimize reconstruction time or to allow the use of a single FAST receiver. All other coil elements are electrically disabled.

Detailed Description Text (22):

FIG. 5 is a wire model of the phased array neurovascular coil 50 in HIGH SPEED BRAIN mode. Like FIG. 4, only the quadrature birdcage coil 60 is activated; the cervical spine coils 70 and the anterior neck coils 80 and 90 are electrically disabled. The HIGH SPEED BRAIN mode may be used for Echo Planar Imaging and/or vascular or other studies of the brain where decreased acquisition time is desirable. HIGH SPEED BRAIN mode is also useful for imaging the Circle of Willis.

Detailed Description Text (23):

Additional modes of operation for the phased array neurovascular coil 50 may be

used by providing the MRI system with the appropriate port masks for the coil interface 100. For example, embodiments of the phased array neurovascular coil 50 may also acquire images from one or more of the following operational modes: HIGH RESOLUTION BRAIN AND CERVICAL SPINE, CERVICAL SPINE and VOLUME NECK. Each of these modes is described in further detail below. For these alternative embodiments, unless otherwise noted, it is assumed that the cervical spine coils 70 are applied separately to the coil interface, rather than being combined at the RF level, and the anterior neck coils 80 and 90 are either combined to provide a single input to the coil interface or replaced by a single anterior neck coil.

Detailed Description Text (24):

High Resolution Brain and Cervical Spine Mode

Detailed Description Text (25):

This mode activates the head and posterior cervical spine coils, and disables the anterior neck coil. This allows focal studies of the brain, brain stem, spinal cord, and cervical spine. The two quadrature components of the MR signal from the birdcage coil 60 each drive a separate receiver channel for optimum uniformity and signal to noise ratio performance. The combiner circuit is electrically disconnected to allow independent reconstruction of the data from the two channels. The two posterior cervical spine coils 70 also each drive a separate receiver channel.

Detailed Description Text (27):

In CERVICAL SPINE mode, the two quadrature components of the MR signal from each of the two posterior cervical spine coil elements 70 each drive a separate receiver channel for optimum uniformity and signal to noise ratio performance. The head coil element 60 and the anterior neck coil 80, 90 are electrically disabled to minimize artifacts and undesirable coil interactions.

Detailed Description Text (29):

This mode disables the tapered birdcage coil covering the head region, and activates the three spine region coils to form a volume acquisition of the neck region. The two quadrature components of the MR signal from each of the two posterior cervical spine coil elements 70 and the anterior neck coil 80, 90 each drive a separate receiver channel for optimum uniformity and signal to noise ratio performance. In one embodiment, the MR signals from the two posterior cervical spine coils 70 are combined at the RF level and applied as a single input to the coil interface 100, along with the two MR signals from the anterior neck coils 80 and 90. For embodiments in which the anterior neck coils 80 and 90 are combined at the RF level, the cervical spine coils 70 are combined at the RF level, or only a single anterior neck coil is used, the acquisition uses an unoccupied channel for the fourth channel [GEMS Signa does not directly support a three coil acquisition; Phased Array Data sets must be from one, two, or four receivers].

Detailed Description Text (30):

As noted above, selection of the modes is made in the coil interface 100 unit by the use of PIN diode RF switches; the switches either direct the two quadrature signals from the two modes of the birdcage coil element 60 to two separate MR receivers, or combine them with a relative phase difference of 90.degree. and direct them to a single receiver. Determination of which mode to support is made via detection of the bias pattern of the ports in the host GEMS Signa MRI system. As will be apparent to those skilled in the art, the electrical length of the path of the various MR signals through the coil interface 100 should be compensated to ensure that the MR signals may be properly combined by the MRI system. For example, the electrical lengths of the paths through the coil interface 100 may be adjusted to be an integer multiple of half wavelengths.

Detailed Description Text (31):

In view of the wide variety of embodiments to which the principles of the present

invention can be applied, it should be understood that the illustrated embodiments are exemplary only, and should not be taken as limiting the scope of the present invention. For example, the steps of the design method may be taken in sequences other than those described, and more or fewer elements may be used than are described. In addition, although reference is made herein to the GEMS Signa MRI system, other systems having similar capabilities may alternatively be used to receive and process signals from the coils described above.

Detailed Description Paragraph Table (1):

Signal SMB System Port System Receiver Head I P4 5 0 Head Q (high res) P5 6 1 Head Q (high speed) P5 5 0 Cspine P7 4 3 ANT SUP P6 3 2 ANT INF P8 2 1

Other Reference Publication (1):

Lin et al., (1998), Magnetic Resonance in Medicine, "A Novel Multi-segment Surface Coil for Neuro-Functional Magnetic Resonance Imaging," vol. 39, pp. 164-168.

Other Reference Publication (2):

Meyer et al, (1995), Journal of Magnetic Resonance, Series B, "A 3X3 Mesh Two-Dimensional Ladder Network Resonator of MRI of the Human Head," vol. 107, pp. 19-24.

Other Reference Publication (3):

Roemer, et al., (1990), Magnetic Resonance in Medicine, "The NMR Phase Array," vol. 16, pp. 192-225.

CLAIMS:

1. A coil interface for coupling a plurality of coil elements in a phased array magnetic resonance imaging coil to a host magnetic resonance imaging system, comprising:

a plurality of signal inputs for coupling to the plurality of coil elements;

a plurality of output ports for coupling to predetermined receivers of the host magnetic resonance imaging system; and

a interface circuit that in a first imaging mode selectively couples at least two signal inputs to an equal number of output ports, and, in a second imaging mode, selectively couples at least two signal inputs to a lesser number of output ports.

2. A coil interface as claimed in claim 1, wherein the interface circuit is remotely configured to couple said plurality of signal inputs to a predetermined sequence of output ports.

3. A coil interface as claimed in claim 1, wherein said plurality of signal inputs comprises an in-phase MR signal and a quadrature MR signal from a quadrature birdcage coil.

6. A coil interface as claimed in claim 1, wherein said plurality of signal inputs exceeds said plurality of output ports in number.

7. A coil interface as claimed in claim 1, wherein a conductive path through said interface circuit between an input from the plurality of signal inputs and an output port from the plurality of output ports has an electrical length that is equal to an integer multiple of half wavelengths.

8. A coil interface as claimed in claim 1, wherein said interface circuit comprises a remotely operable PIN diode switch and a 90.degree. phase shift.

9. A coil interface as claimed in claim 8, wherein PIN diode switch is operable

from an operator's console for the magnetic resonance imaging system.

10. A coil interface as claimed in claim 1, wherein a first signal input comprises an in-phase magnetic resonance signal from a quadrature coil element within said plurality of coil elements and a second signal input comprises a quadrature magnetic resonance signal from the quadrature coil element.

14. A method of operating a quadrature phased array MR coil in a plurality of imaging modes, comprising:

providing an interface circuit that selectively couples a plurality of elements of the quadrature phased array MR coil to a host MRI system, wherein the plurality of elements comprises at least one quadrature element, the at least one quadrature element generating an in-phase MR signal output that is coupled to the interface circuit and a quadrature MR signal output that is coupled to the interface circuit;

selecting a first imaging mode from the plurality of imaging modes; and

responsively configuring the interface circuit to couple the in-phase MR signal output to a first receiver in the host MRI system and to couple the quadrature MR signal output to a second receiver in the host MRI system.

15. A method as claimed in claim 14, further comprising the step of disabling unused coil elements in the quadrature phased array MR coil in accordance with the selection of the imaging mode.

16. A method as claimed in claim 14, wherein the step of configuring the interface circuit comprises adjusting a state of a radio frequency switch.

17. A method as claimed in claim 16, the state of the radio frequency switch causes an in-phase MR signal output from a quadrature element of the quadrature phased array MR coil to be routed to a first receiver input, and causes a quadrature MR signal output from the quadrature element to be routed to a second receiver input.

18. A method as claimed in claim 16, wherein the state of the radio frequency switch causes an in-phase MR signal output from a quadrature element of the quadrature phased array MR coil to be combined with a quadrature MR signal output from the quadrature element forming a combined MR signal, the combined MR signal being coupled by the interface circuit to a single receiver input.

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☐ 1. Document ID: US 20020190716 A1

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L44: Entry 1 of 6

File: PGPB

Dec 19, 2002

PGPUB-DOCUMENT-NUMBER: 20020190716

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020190716 A1

TITLE: Multimode operation of quadrature phased array MR coil systems

PUBLICATION-DATE: December 19, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Misic, George J.	Allison Park	PA	US	

US-CL-CURRENT: [324/318](#); [324/309](#), [324/322](#), [335/297](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	RVNC	Draw D
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☐ 2. Document ID: US 20020125888 A1

L44: Entry 2 of 6

File: PGPB

Sep 12, 2002

PGPUB-DOCUMENT-NUMBER: 20020125888

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020125888 A1

TITLE: Magnetic resonance imaging apparatus

PUBLICATION-DATE: September 12, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Visser, Frederik	Eindhoven		NL	
Haans, Paulus Cornelius Hendrikus Adrianus	Eindhoven		NL	
Van Den Brink, Johan Samuel	Eindhoven		NL	

US-CL-CURRENT: [324/318](#); [324/309](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWC	Draw De
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☐ 3. Document ID: US 6549799 B2

L44: Entry 3 of 6

File: USPT

Apr 15, 2003

US-PAT-NO: 6549799

DOCUMENT-IDENTIFIER: US 6549799 B2

TITLE: Concurrent MRI of multiple objects

DATE-ISSUED: April 15, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bock; Nicholas A.	London			CA
Henkelman; R. Mark	Toronto			CA

US-CL-CURRENT: 600/422; 324/307, 324/309, 600/410, 600/411

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw De
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☐ 4. Document ID: US 6150816 A

L44: Entry 4 of 6

File: USPT

Nov 21, 2000

US-PAT-NO: 6150816

DOCUMENT-IDENTIFIER: US 6150816 A

TITLE: Radio-frequency coil array for resonance analysis

DATE-ISSUED: November 21, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Srinivasan; Ravi	Richmond Heights	OH		

US-CL-CURRENT: 324/318; 324/322

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw De
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☐ 5. Document ID: US 5041789 A

L44: Entry 5 of 6

File: USPT

Aug 20, 1991

US-PAT-NO: 5041789

DOCUMENT-IDENTIFIER: US 5041789 A

TITLE: Magnetic-resonance instrument employing barcode experiment specification

DATE-ISSUED: August 20, 1991

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Keller; Tony	Reinstetten-Forchheim			DE
Laukien; Gunther R.	Rheinstetten			DE
Spraul; Manfred	Ettlingen			DE

US-CL-CURRENT: 324/318; 324/322

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KNAC	Draw	Doc

☐ 6. Document ID: US 4689563 A

L44: Entry 6 of 6

File: USPT

Aug 25, 1987

US-PAT-NO: 4689563

DOCUMENT-IDENTIFIER: US 4689563 A

TITLE: High-field nuclear magnetic resonance imaging/spectroscopy system

DATE-ISSUED: August 25, 1987

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bottomley; Paul A.	Clifton Park	NY		
Edelstein; William A.	Schenectady	NY		
Hart, Jr.; Howard R.	Schenectady	NY		
Schenck; John F.	Schenectady	NY		
Redington; Rowland W.	Schenectady	NY		
Leue; William M.	Albany	NY		

US-CL-CURRENT: 324/309

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KNAC	Draw	Doc

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CONTROLA	273
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CONTROLAB	4
CONTROLABIL	1

CONTROLABL	3
CONTROLABLD	1
CONTROLABLE	925
CONTROLABLI	2
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☐ 1. Document ID: US 20030020475 A1

Using default format because multiple data bases are involved.

L45: Entry 1 of 12

File: PGPB

Jan 30, 2003

PGPUB-DOCUMENT-NUMBER: 20030020475

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030020475 A1

TITLE: RF coil system for an MR apparatus

PUBLICATION-DATE: January 30, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Leussler, Christoph Guenther	Hamburg		DE	

US-CL-CURRENT: [324/318](#); [324/309](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	NWAC	Draw D
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☐ 2. Document ID: US 20020130661 A1

L45: Entry 2 of 12

File: PGPB

Sep 19, 2002

PGPUB-DOCUMENT-NUMBER: 20020130661

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020130661 A1

TITLE: Nuclear magnetic resonance analysis of multiple samples

PUBLICATION-DATE: September 19, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Rafferty, Daniel	Lafayette	IN	US	
Fisher, George G.	Oak Harbor	WA	US	
Petucci, Christopher J.	Memphis	TN	US	
McNamara, Ernesto	Alexandria	VA	US	

US-CL-CURRENT: [324/318](#); [324/309](#), [324/321](#), [324/322](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWC	Draw De
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☐ 3. Document ID: US 20020125888 A1

L45: Entry 3 of 12

File: PGPB

Sep 12, 2002

PGPUB-DOCUMENT-NUMBER: 20020125888

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020125888 A1

TITLE: Magnetic resonance imaging apparatus

PUBLICATION-DATE: September 12, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Visser, Frederik	Eindhoven		NL	
Haans, Paulus Cornelius Hendrikus Adrianus	Eindhoven		NL	
Van Den Brink, Johan Samuel	Eindhoven		NL	

US-CL-CURRENT: 324/318; 324/309

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWC	Draw De
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☐ 4. Document ID: US 6650118 B2

L45: Entry 4 of 12

File: USPT

Nov 18, 2003

US-PAT-NO: 6650118

DOCUMENT-IDENTIFIER: US 6650118 B2

TITLE: RF coil system for an MR apparatus

DATE-ISSUED: November 18, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Leussler, Christoph Guenther	Hamburg			DE

US-CL-CURRENT: 324/318; 324/322

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWC	Draw De
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☐ 5. Document ID: US 6549799 B2

L45: Entry 5 of 12

File: USPT

Apr 15, 2003

US-PAT-NO: 6549799

DOCUMENT-IDENTIFIER: US 6549799 B2

TITLE: Concurrent MRI of multiple objects

DATE-ISSUED: April 15, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bock; Nicholas A.	London			CA
Henkelman; R. Mark	Toronto			CA

US-CL-CURRENT: 600/422; 324/307, 324/309, 600/410, 600/411

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw D
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☐ 6. Document ID: US 6501274 B1

L45: Entry 6 of 12

File: USPT

Dec 31, 2002

US-PAT-NO: 6501274

DOCUMENT-IDENTIFIER: US 6501274 B1

TITLE: Magnetic resonance imaging system using coils having paraxially distributed transmission line elements with outer and inner conductors

DATE-ISSUED: December 31, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ledden; Patrick	Malden	MA		

US-CL-CURRENT: 324/318

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw D
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☐ 7. Document ID: US 6194900 B1

L45: Entry 7 of 12

File: USPT

Feb 27, 2001

US-PAT-NO: 6194900

DOCUMENT-IDENTIFIER: US 6194900 B1

TITLE: Integrated miniaturized device for processing and NMR detection of liquid phase samples

DATE-ISSUED: February 27, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Freeman; Dominique M.	Pescadero	CA		

Swedberg; Sally A.

Palo Alto CA

US-CL-CURRENT: 324/321; 324/318

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KUOC	Draw De
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☐ 8. Document ID: US 6150816 A

L45: Entry 8 of 12

File: USPT

Nov 21, 2000

US-PAT-NO: 6150816

DOCUMENT-IDENTIFIER: US 6150816 A

TITLE: Radio-frequency coil array for resonance analysis

DATE-ISSUED: November 21, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Srinivasan; Ravi	Richmond Heights	OH		

US-CL-CURRENT: 324/318; 324/322

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KUOC	Draw De
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☐ 9. Document ID: US 5999000 A

L45: Entry 9 of 12

File: USPT

Dec 7, 1999

US-PAT-NO: 5999000

DOCUMENT-IDENTIFIER: US 5999000 A

TITLE: Radio-frequency coil and method for resonance imaging/analysis

DATE-ISSUED: December 7, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Srinivasan; Ravi	Richmond Heights	OH		

US-CL-CURRENT: 324/318; 324/322

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KUOC	Draw De
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☐ 10. Document ID: US 5777474 A

L45: Entry 10 of 12

File: USPT

Jul 7, 1998

US-PAT-NO: 5777474

DOCUMENT-IDENTIFIER: US 5777474 A

TITLE: Radio-frequency coil and method for resonance imaging/analysis

DATE-ISSUED: July 7, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Srinivasan; Ravi	Richmond Heights	OH		

US-CL-CURRENT: 324/318; 324/322

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw. Des
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☐ 11. Document ID: US 5041789 A

L45: Entry 11 of 12

File: USPT

Aug 20, 1991

US-PAT-NO: 5041789

DOCUMENT-IDENTIFIER: US 5041789 A

TITLE: Magnetic-resonance instrument employing barcode experiment specification

DATE-ISSUED: August 20, 1991

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Keller; Tony	Reinstetten-Forchheim			DE
Laukien; Gunther R.	Rheinstetten			DE
Spraul; Manfred	Ettlingen			DE

US-CL-CURRENT: 324/318; 324/322

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw. Des
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☐ 12. Document ID: US 4689563 A

L45: Entry 12 of 12

File: USPT

Aug 25, 1987

US-PAT-NO: 4689563

DOCUMENT-IDENTIFIER: US 4689563 A

TITLE: High-field nuclear magnetic resonance imaging/spectroscopy system

DATE-ISSUED: August 25, 1987

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bottomley; Paul A.	Clifton Park	NY		
Edelstein; William A.	Schenectady	NY		

Hart, Jr.; Howard R.	Schenectady	NY
Schenck; John F.	Schenectady	NY
Redington; Rowland W.	Schenectady	NY
Leue; William M.	Albany	NY

US-CL-CURRENT: 324/309

Full	Title	Classification	Front	Review	Classification	Date	Reference	Claims	KMC	Draw D
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Clear	Generate Collection	Print	Fwd Refs	Bkwd Refs	Generate OACS
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Term	Documents
SENSE	982171
SENSES	168990
SENSITIV\$4	0
SENSITIV	2562
SENSITIVA	44
SENSITIVANG	3
SENSITIVAT	1
SENSITIVATY	2
SENSITIVB	86
SENSITIVBO	1
SENSITIVBTO	1
(L42 AND ("SENSE" OR SENSITIV\$4)).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	12

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DATE: Sunday, February 15, 2004

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		<i>DB=PGPB,USPT,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=ADJ</i>	
<input type="checkbox"/>	L19	L17 not l18	15
<input type="checkbox"/>	L18	L17 and (control\$6 with switch\$3)	7
		<i>DB=USPT,PGPB,JPAB,EPAB,DWPI,TDBD; PLUR=YES; OP=ADJ</i>	
<input type="checkbox"/>	L17	L16 and (encod\$4 or spatial\$3)	22
<input type="checkbox"/>	L16	L15 and (sensitivity)	22
<input type="checkbox"/>	L15	L14 and (independent\$4)	26
<input type="checkbox"/>	L14	L13 and (array or neighbor\$6 or proximity or other)	36
<input type="checkbox"/>	L13	L12 and ("sense")	43
<input type="checkbox"/>	L12	L11 and ((two or "2" or four or "4" or second or secondary or fourth or quadrature or quadrupole or quadratic) with ("set" or group or plurality or multiple or number or another))	148
<input type="checkbox"/>	L11	L10 and (((radio adj frequency) or RF or radio-frequency or radiofrequency) with (coil or antenna or probe))	168
<input type="checkbox"/>	L10	L9 and (phase)	171
<input type="checkbox"/>	L9	L8 and (birdcage or (head with coil) or (volume with resonator))	209
<input type="checkbox"/>	L8	L7 and (select\$4 or choos\$4 or rout\$4 or chosen or pick\$4 or identif\$9 or control\$8 or direct\$4)	971
<input type="checkbox"/>	L7	L6 and ((channel or line or input) with (receiv\$4 or detect\$6 or sens\$4))	975
<input type="checkbox"/>	L6	L5 and (channel or line or input)	1546
<input type="checkbox"/>	L5	L4 and (("set" or group or plurality or multiple or number or second or secondary or another) with (coil or antenna or probe))	1697
<input type="checkbox"/>	L4	L3 and ((radio adj frequency) or RF or radio-frequency or radiofrequency)	3588
<input type="checkbox"/>	L3	L2 and (receiv\$4 or detect\$6 or sens\$4)	10091
<input type="checkbox"/>	L2	L1 and ((combin\$8 or composite or add\$6) with (signal))	10982
<input type="checkbox"/>	L1	((magnetic adj resonance) or MRI or NMR)	166077

END OF SEARCH HISTORY

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[Generate OACS](#)

Search Results - Record(s) 1 through 15 of 15 returned.

☐ 1. Document ID: US 20040002645 A1

Using default format because multiple data bases are involved.

L19: Entry 1 of 15

File: PGPB

Jan 1, 2004

PGPUB-DOCUMENT-NUMBER: 20040002645

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040002645 A1

TITLE: High-resolution magnetoencephalography system and method

PUBLICATION-DATE: January 1, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Ewing, Anthony P.	San Diego	CA	US	
Okada, Yoshio	Albuquerque	NM	US	
Paulson, Douglas N.	Del Mar	CA	US	
Starr, Tatiana N.	San Diego	CA	US	

US-CL-CURRENT: 600/409

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMC	Draw D
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☐ 2. Document ID: US 20030214301 A1

L19: Entry 2 of 15

File: PGPB

Nov 20, 2003

PGPUB-DOCUMENT-NUMBER: 20030214301

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030214301 A1

TITLE: Method and apparatus for decoupling RFdetector arrays for magnetic resonance
imaging

PUBLICATION-DATE: November 20, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Lee, Ray Fli	Clifton Park	NY	US	

US-CL-CURRENT: 324/322; 324/309, 324/318

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWC	Drawings
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☐ 3. Document ID: US 20030160622 A1

L19: Entry 3 of 15

File: PGPB

Aug 28, 2003

PGPUB-DOCUMENT-NUMBER: 20030160622

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030160622 A1

TITLE: Method and apparatus for noise tomography

PUBLICATION-DATE: August 28, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Duensing, G. Randy	Gainesville	FL	US	
Saylor, Charles	Gainesville	FL	US	
Huang, Feng	Gainesville	FL	US	

US-CL-CURRENT: 324/691; 374/137, 702/130, 702/57

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWC	Drawings
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☐ 4. Document ID: US 20020103429 A1

L19: Entry 4 of 15

File: PGPB

Aug 1, 2002

PGPUB-DOCUMENT-NUMBER: 20020103429

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020103429 A1

TITLE: Methods for physiological monitoring, training, exercise and regulation

PUBLICATION-DATE: August 1, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
deCharms, R. Christopher	Moss Beach	CA	US	

US-CL-CURRENT: 600/410

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWC	Drawings
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☐ 5. Document ID: US 20020042563 A1

L19: Entry 5 of 15

File: PGPB

Apr 11, 2002

PGPUB-DOCUMENT-NUMBER: 20020042563
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020042563 A1

TITLE: Method and apparatus for objectively measuring pain, pain treatment and other related techniques

PUBLICATION-DATE: April 11, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Becerra, Lino R.	Cambridge	MA	US	
Breiter, Hans C.	Lincoln	MA	US	
Borsook, David	Concord	MA	US	

US-CL-CURRENT: 600/407; 600/411, 600/420, 600/427, 600/431, 600/473, 600/475

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMC	Draw. De
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☐ 6. Document ID: US 6624630 B1

L19: Entry 6 of 15

File: USPT

Sep 23, 2003

US-PAT-NO: 6624630
DOCUMENT-IDENTIFIER: US 6624630 B1

TITLE: Sliding frequency steady-state precession imaging

DATE-ISSUED: September 23, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Foxall; David L.	Mentor	OH		

US-CL-CURRENT: 324/307; 324/309

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw. De
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☐ 7. Document ID: US 6501274 B1

L19: Entry 7 of 15

File: USPT

Dec 31, 2002

US-PAT-NO: 6501274
DOCUMENT-IDENTIFIER: US 6501274 B1

TITLE: Magnetic resonance imaging system using coils having paraxially distributed transmission line elements with outer and inner conductors

DATE-ISSUED: December 31, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ledden; Patrick	Malden	MA		

US-CL-CURRENT: 324/318

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw. De
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☐ 8. Document ID: US 6289232 B1

L19: Entry 8 of 15

File: USPT

Sep 11, 2001

US-PAT-NO: 6289232

DOCUMENT-IDENTIFIER: US 6289232 B1

TITLE: Coil array autocalibration MR imaging

DATE-ISSUED: September 11, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Jakob; Peter M.	Brookline Village	MA		
Sodickson; Daniel K.	Cambridge	MA		
Griswold; Mark	Brookline	MA		

US-CL-CURRENT: 600/410; 324/307, 324/309, 324/318, 324/322, 600/422

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw. De
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☐ 9. Document ID: US 5910728 A

L19: Entry 9 of 15

File: USPT

Jun 8, 1999

US-PAT-NO: 5910728

DOCUMENT-IDENTIFIER: US 5910728 A

TITLE: Simultaneous acquisition of spatial harmonics (SMASH): ultra-fast imaging with radiofrequency coil arrays

DATE-ISSUED: June 8, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Sodickson; Daniel Kevin	Cambridge	MA		

US-CL-CURRENT: 324/309

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw. De
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☐ 10. Document ID: US 5898306 A

L19: Entry 10 of 15

File: USPT

Apr 27, 1999

US-PAT-NO: 5898306

DOCUMENT-IDENTIFIER: US 5898306 A

**** See image for Certificate of Correction ****TITLE: Single circuit ladder resonator quadrature surface RF coil

DATE-ISSUED: April 27, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Liu; Haiying	Minneapolis	MN		
Truwit; Charles L.	Wayzata	MN		

US-CL-CURRENT: 324/322; 324/318

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw. D
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☐ 11. Document ID: US 5560360 A

L19: Entry 11 of 15

File: USPT

Oct 1, 1996

US-PAT-NO: 5560360

DOCUMENT-IDENTIFIER: US 5560360 A

**** See image for Certificate of Correction ****

TITLE: Image neurography and diffusion anisotropy imaging

DATE-ISSUED: October 1, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Filler; Aaron G.	Seattle	WA		
Tsurda; Jay S.	Mercer Island	WA		
Richards; Todd L.	Seattle	WA		
Howe; Franklyn A.	London			GB2

US-CL-CURRENT: 600/408; 324/307

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw. D
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☐ 12. Document ID: US 5212450 A

L19: Entry 12 of 15

File: USPT

May 18, 1993

US-PAT-NO: 5212450

DOCUMENT-IDENTIFIER: US 5212450 A

TITLE: Radio frequency volume resonator for nuclear magnetic resonance

DATE-ISSUED: May 18, 1993

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Murphy-Boesch; Joseph	Lafayette Hills	PA		
Srinivasan; Ravi	Philadelphia	PA		
Carvajal; Lucas	North Hills	PA		

US-CL-CURRENT: 324/322; 324/318

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 13. Document ID: US 5202635 A

L19: Entry 13 of 15

File: USPT

Apr 13, 1993

US-PAT-NO: 5202635

DOCUMENT-IDENTIFIER: US 5202635 A

TITLE: Radio frequency volume resonator for nuclear magnetic resonance

DATE-ISSUED: April 13, 1993

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Srinivasan; Ravi	Philadelphia	PA		
Murphy-Boesch; Joseph	Lafayette Hills	PA		

US-CL-CURRENT: 324/322; 324/318

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 14. Document ID: US 5194811 A

L19: Entry 14 of 15

File: USPT

Mar 16, 1993

US-PAT-NO: 5194811

DOCUMENT-IDENTIFIER: US 5194811 A

TITLE: Radio frequency volume resonator for nuclear magnetic resonance

DATE-ISSUED: March 16, 1993

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Murphy-Boesch; Joseph	Lafayette Hill	PA		
Srinivasan; Ravi	Philadelphia	PA		

US-CL-CURRENT: 324/322; 324/318

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw. Des
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☐ 15. Document ID: US 5050605 A

L19: Entry 15 of 15

File: USPT

Sep 24, 1991

US-PAT-NO: 5050605

DOCUMENT-IDENTIFIER: US 5050605 A

**** See image for Certificate of Correction ****TITLE: Magnetic resonance imaging antennas with spiral coils and imaging methods employing the same

DATE-ISSUED: September 24, 1991

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Eydelman; Gregory	West Hempstead	NY		
Giambalvo; Anthony	Kings Park	NY		
Damadian; Raymond V.	Woodbury	NY		

US-CL-CURRENT: 600/422; 324/318, 324/322

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw. Des
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Term	Documents
(17 NOT 18).PGPB,USPT,EPAB,JPAB,DWPI,TDBD.	15
(L17 NOT L18).PGPB,USPT,EPAB,JPAB,DWPI,TDBD.	15

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Search Results - Record(s) 1 through 7 of 7 returned.

☐ 1. Document ID: US 20030146750 A1

Using default format because multiple data bases are involved.

L18: Entry 1 of 7

File: PGPB

Aug 7, 2003

PGPUB-DOCUMENT-NUMBER: 20030146750

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030146750 A1

TITLE: RF coil for imaging system

PUBLICATION-DATE: August 7, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Vaughan, J. Thomas JR.	Stillwater	MN	US	

US-CL-CURRENT: 324/318; 707/104.1

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	NUC	Draw D
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☐ 2. Document ID: US 20020125888 A1

L18: Entry 2 of 7

File: PGPB

Sep 12, 2002

PGPUB-DOCUMENT-NUMBER: 20020125888

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020125888 A1

TITLE: Magnetic resonance imaging apparatus

PUBLICATION-DATE: September 12, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Visser, Frederik	Eindhoven		NL	
Haans, Paulus Cornelius Hendrikus Adrianus	Eindhoven		NL	
Van Den Brink, Johan Samuel	Eindhoven		NL	

US-CL-CURRENT: 324/318; 324/309

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWC	Draw D
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☐ 3. Document ID: US 20020087063 A1

L18: Entry 3 of 7

File: PGPB

Jul 4, 2002

PGPUB-DOCUMENT-NUMBER: 20020087063

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020087063 A1

TITLE: New method and system for processing magnetic resonance signals to remove transient spike noise

PUBLICATION-DATE: July 4, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Lou, Xiaoming	Waukesha	WI	US	

US-CL-CURRENT: 600/410

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWC	Draw D
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☐ 4. Document ID: US 6633161 B1

L18: Entry 4 of 7

File: USPT

Oct 14, 2003

US-PAT-NO: 6633161

DOCUMENT-IDENTIFIER: US 6633161 B1

TITLE: RF coil for imaging system

DATE-ISSUED: October 14, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Vaughan, Jr.; J. Thomas	Stillwater	MN		

US-CL-CURRENT: 324/318; 324/322

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw D
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☐ 5. Document ID: US 6529000 B2

L18: Entry 5 of 7

File: USPT

Mar 4, 2003

US-PAT-NO: 6529000

DOCUMENT-IDENTIFIER: US 6529000 B2

TITLE: Method and system for processing magnetic resonance signals to remove

transient spike noise

DATE-ISSUED: March 4, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Lou; Xiaoming	Waukesha	WI		

US-CL-CURRENT: 324/309; 324/318, 324/322

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWOC	Draw D
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☐ 6. Document ID: US 5977770 A

L18: Entry 6 of 7

File: USPT

Nov 2, 1999

US-PAT-NO: 5977770

DOCUMENT-IDENTIFIER: US 5977770 A

TITLE: MR imaging of synchronous spin motion and strain waves

DATE-ISSUED: November 2, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ehman; Richard L.	Rochester	MN		

US-CL-CURRENT: 324/318; 600/421

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWOC	Draw D
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☐ 7. Document ID: US 5592085 A

L18: Entry 7 of 7

File: USPT

Jan 7, 1997

US-PAT-NO: 5592085

DOCUMENT-IDENTIFIER: US 5592085 A

**** See image for Certificate of Correction ****

TITLE: MR imaging of synchronous spin motion and strain waves

DATE-ISSUED: January 7, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ehman; Richard L.	Rochester	MN		

US-CL-CURRENT: 324/309; 324/307

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWOC	Draw D
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Clear	Generate Collection	Print	Fwd Refs	Bkwd Refs	Generate OACS
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Term	Documents
CONTROL\$6	0
CONTROL	5040600
CONTROLA	32
CONTROLAB	1
CONTROLABALE	1
CONTROLABILY	1
CONTROLABILTY	2
CONTROLABILITY	1
CONTROLABL	1
CONTROLABLE	772
CONTROLABLES	1
(L17 AND (CONTROL\$6 WITH SWITCH\$3)).PGPB,USPT,EPAB,JPAB,DWPI,TDBD.	7

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